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TITUSVILLE AMATEUR RADIO CLUB

JUNE, 1993

NEWSLETTER

OFFICERS

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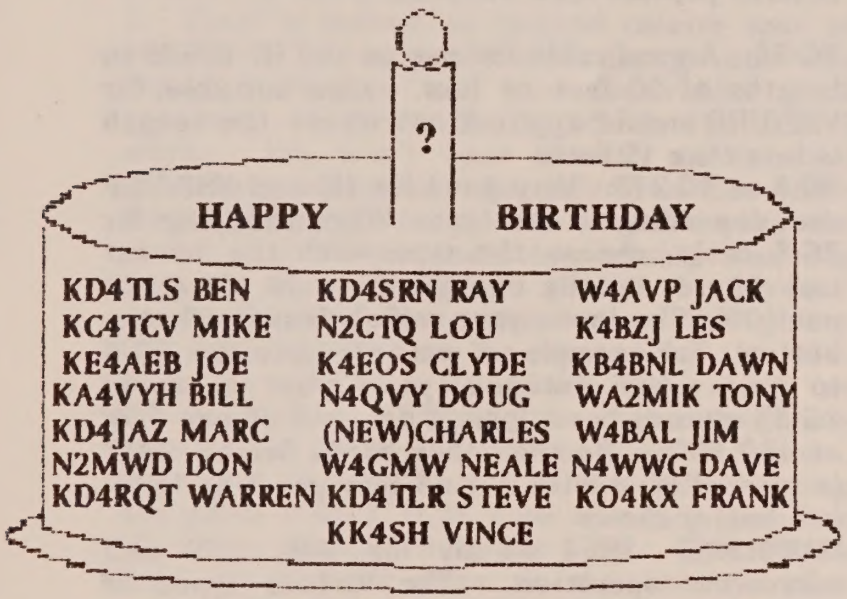


PRESIDENT'S CORNER

By Bud Hughes K4CWG

Vince, KK4SH and his Field Day Committee are making good progress on preparing for our club's Field Day activities on June 26 & 27 (Saturday & Sunday). For those who were unable to attend the "shoot-the-arrow-over-the-tree" antenna put'em up party on June 5th, you sure missed a lot of fun.

For our new members who have never joined in the Field Day fun, I dare you to give me a land line or catch me on 2 meters, and I'll just bet I can convience you to get involved and be a part of your club's Field Day operations.

You know what I think? I think that the old sly fox John, KB3GK has been reading about Billy Goat Gruff and his bridge over which no one was supposed to cross without permission. Well, the fox was hiding under the bridge and watching as the hunters crossed going North, then turned around and recrossed while that old fox was underneath the overpass just grinning and watching.

Even with the special US1 overpassing the railroad the hunters zeroed in and found the fox. Everyone enjoyed the hot dogs, soda, and the best home made ice cream I've ever tasted. By the way, I was fortunate enough to be with Les K4SJC and Vern KB4RBU and they were the first to get to that fox den.

See you at the meeting on 06/22/93.

EDITOR'S DESK

By Clyde Lee K4EOS

Jim Creevay W4UYZ, who publishes the DX Bluebook, has offered the use of his printing facilities to us for printing the newsletter, and this is the first issue using his equipment. The Emma Parrish Theatre has been printing for us. and we thank them for all their help. If you were at the May meeting you may have managed to get one of the Ham Zoo - A Collection of Hamaginary Critters booklets. These were printed at Jim's QTH in Port St. John. The club is grateful to Jim for this service. We are also grateful to Jim Meeks, N4ZNQ for allowing us to reprint the booklet which was drawn by his friend from West Virginia.

DOPPLER KITS

From VMS News - Byon Garrabrant, KD6BCH

I have located a source for Doppler direction finding kits. The circuit appears to be based on the project described in "TRANSMITTER HUNTING - Radio Direction Finding Simplified" by Moell and Curlee. The kit comes with 2 printed circuit boards, one for the display and one for the rest. All parts are included to build the decoder and antenna switching circuitry, but the antenna parts are not included.

>Dopplers have their place in one's T-hunting arsenal. They are useful for locating mobile foxes and medium to strong vertical signals. They are not so useful for locating weak horizontal signals, especially when hunting in areas of strong adjacent channels.

>The kits are available from Marty Mitchell, N6ZAV at (714)760-6060. They cost $99 plus $3 for shipping.

HAM WITH SCANNER OVERHEARS PLOT

From May, 1993 QST

An Arizona amateur has been credited with helping to expose an apparent plot by two teenagers to poison a teacher and a classmate.

>Wayne Spaulding, KB7JYG of Mesa, Arizona, overheard a cordless telephone conversation on the 46-MHz band on the evening of March 10, in which poisoning was mentioned. He taped the conversation and called the police the next day.

>Police played the tape for the Mesa High School track coach Gary Butler, who identified the two voices on the tape as those of students in his homeroom, one a 16 year old and the other 17 years old. Butler was one of the youth's apparent targets, as was a 15 year old girl.

>Police have booked both teenagers on suspicion of conspiracy to commit murder. Police said one of the youths had a "sizable amount" of poisonous drain cleaner with him at the time of his arrest, according to the Arizona Republic.

>Police told the newspaper that eavesdropping on cordless telephones isn't Illegal, but implied that the reception was made on a "ham radio," when, in fact, Wayne was listening on a ordinary consumer scanner radio.

>The two youths were scheduled for hearings in early April to determine whether they should be tried as adults on the conspiracy charges.

>Wayne has been a licensed amateur for about 2-1/2 years and his primary interests are on the UHF amateur bands. He and wife Cheri, N7PHR, hold Technician class licenses. Wayne, coincidentally, works for the Mesa school system, designing and building electronic equipment to enable disabled students to use computers.

RADIO TIPS

From April, 1993 QST

What Type of Feed Line Should I Use?

The feed line is the cable that transfers energy from your radio to your antenna and vice versa. The type of feed line you select is extremely important. If you choose the wrong type , you may find that you're actually losing much of the power going to and from your antennal For the same reason that power loss in a long extension cord makes an electric space heater run cooler, radio feed-line loss weakens signals as they travel through the feed line between your radio and your antenna. Here is a brief summary of several popular feed lines:

RG-58: A good cable for use on the HF bands in lengths of 50 feet or less. Also suitable for VHF/UHF mobile applications where the length is less than 15 feet.

RG-8 or RG-213: Very good for HF and VHF/UHF use, depending on the type. When shopping for RG-8 cable, choose the type with the lowest loss figure, usually expressed in dB (decibels) per 100'. The lower your cable's loss in dB, the better. For example, if you intend to use RG-8 to feed a VHF antenna, you'd want to avoid RG-8X since it has a loss of nearly 4 dB per 100' at 100 MHz. On the other hand, Belden 9913 (a type of RG-8 with 1.4 dB loss per 100' MHz) is a better choice.

HARDLINE: Used mainly for VHF, UHF and microwave operation. The various types of Hardline are classified according to the diameter of the cable (1/2", 7/8" and 3/4" are common). Although Hardline offers very low loss, it is expensive and difficult to install. You may hear Hardline referred to by the trade name HELIAX.

OPEN WIRE: Often called ladder line, this cable consists of two wires separated by spaced bars of insulating material. An open wire feed line has extremely low loss at HF frequencies and is very inexpensive. However, you must own an antenna tuner capable of matching this type of feed line (modern radios are not equipped to accommodate open wire directly). Also, you must take care to keep the cable away from metal objects such as gutters, aluminum siding and so on. Since open wire cable is not shielded, any nearby metal can affect its operation.

WB8IMY

PROBLEM & SOLUTION - HTX202
By Steve Griner KC4UAK

PROBLEM: If you have one of these Radio Shack handhelds and have ever turned it on - only to have E1 show up in the display, you had to clear all memories and spend 1 to 1-1/2 hours reprogramming everything, only to have it happen again.

SOLUTION: Return to store to be sent in for new upgraded Lithium memory battery. Radio Shack knows about this problem from a memo sent out in February, 1993, from their tech department. Or, call 1-817-390-3011. The service rep is Mark.

MORE ON THE RADIO SHACK HTX202
By K6LTS Don Montgomery

As others have mentioned previously, I found a few undocumented "features" in my HTX202 and others I've tried out:

1. There is indeed an in-band receive spur at 146.76. This signal is radiated out the transceiver's case and into the rubber duck antenna. It reads about 3-5 on the LCD S meter. You won't hear it with an external antenna removed any distance from the radio itself. Fishing around with an antenna probe shows most of the radiation coming from the keypad. I haven't figured out all the "tweets" associated with this radio, but at first glance this spur appears to be caused by the 41st harmonic of the UP clock (operating at 3.579545 Mhz). Changing the crystal frequency would move the spur to a less popular channel, but might throw off some of the radio's timing and affect DTMF/CTCSS tone accuracy providing these are generated by the CPU. BTW, if you hold the HTX202 close to the antenna of a communications receiver tuned to 3.58 Mhz, you can hear the color-burst crystal radiation. You can also hear the 146.76 spur on another 2-meter radio held close to the HTX202.
2. The second weirdness involves the power save option. With the radio's duty cycle (PS in the configuration menu) set at something less than 1-8, and SAVE feature enabled, the RPG (Tuning knob) hangs up when manually selecting memory channels. The up/down buttons work normally, as does the 1-16 duty cycle.
3. Another interesting glitch is the way the radio behaves when the battery fails. When the "batt" icon appears on the LCD screen, you will not have much time left for transmission. Further transmitting will blank out the LCD display screen, but the radio keeps transmitting at the last selected frequency, although with some very hairy-sounding sidebands. Releasing the PTT switch does nothing - the radio keeps transmitting until the power is switched off. You also can't get any mike audio thru the transceiver at this point.
4. I find the DTMF REPLY feature unusable with transceivers having long DTMF/PTT transmit hangtimes. By the time the inquiring transceiver has gone back to receive, the HTX202 has already sent out the DTMF # reply. I think it should really respond after some time delay or upon local squelch closure to make sure the inquiring transceiver has recovered back to receive mode.

>The receiver is pretty sensitive. I checked mine at about 0.18uV/20 db quieting. The first LO leakage out the antenna port is about -57dbm. As mentioned previously, I also found a lot of leakage coming from the keypad area. BTW, the first LO radiation falls from 122.6 to 126.6 Mhz, so I'd be pretty careful using this radio near operating aircraft. Someone mentioned transmitter hang-on when tone squelch is used. My unit stops sending PL tone as soon as the PTT is released and the transmitter drops off about 100 milliseconds later. The unit doesn"t send out any type of "reverse burst".

>.Anyway, great radio, great price. Anyone know when the HTX202A is coming out?

ED.NOTE: The HTX202 has become a popular unit for 2 meters. We will continue to publish submitted articles (pro and con) concerning this radio. If you have info on your favorite radio, let the club members know about it by submitting an article to your newsletter.

THINGS TO REMEMBER

The value of time.
The success of perseverence.
The pleasure of working.
The dignity of simplicity.
The worth of character.
The influence of example.
The obligation of duty.
The wisdom of economy.
The virtue of patience.
The improvement of talent.
The joy of originating.
The power of kindness.
By Dean Bunn

FOR SALE
TILT BASE FOR A ROHN TOWER
$35.00
JIM N4ZNQ - 268-1197

BEYOND THE HAM BANDS
By George V. Bortle KD4CBV

Emergency Services monitoring in Brevard County is more difficult since the 800 MHz trunk system has become operational. Although Brevard County Fire/Rescue, Sheriff's Office, Titusville, and several other cities have migrated to the 800 MHz band, there are still many active VHF and UHF frequencies in the area. Dispatching of BCFR's fire and ambulance calls are done on the following frequencies: North - 154.385, Merritt Island - 154.445, South - 154.175, Cape Canaveral - 154.295, Cocoa - 154.190, Cocoa Beach - 154.130, Melbourne - 155.040, Rockledge - 154.415, Orange County Fire dispatches on 153.950, Orlando on 453.05.

Ambulances can be heard reporting to "Control" on Med 9 - 462.950. Patient status is relayed to Parrish Medical Center on Med 4 - 463.075. "Air Care" helicopter communicates with Orlando Regional Medical Center on 155.340. Florida Hospital's "Faith Flight" helicopter is on 155.400. The Central Florida Emergency Medical Net operates on 155.280.

>The Red Cross disaster services operate on a low band frequency of 47.420. This is used nationwide.

>Tune in to excitement of Emergency Services where you'll hear professional and volunteer firefighters and paramedics in action.

>The Central Florida Listeners Net meets on Sunday evenings at 20:00 EDT on 146.73 - (103.5 tone). This net is for the exchange of information related to scanner and shortwave listening outside the normal ham bands. Be sure to listen and check-in.

>Next month we'll get ready for the summer storms with NOAA weather, Hurrican Hunters, and Utility companies' repair dispatch. 73's

The University of Central Florida Amateur Radio Club and the Central Florida Repeater Association will hold their semi-annual free Tailgate Party in the Education Building Parking Lot at UCF on June 19, 1993. Talk-in will be on 146.64 (- no tone) or 147.06 (+ 103.5 tone). The tailgating starts early - about sunrise - to avoid the heat of the day, and continues until about noon. Usually there are about 70 - 100 cars that show up for this event, but there is plenty of room for more. So drop by - meet other hams, and enjoy yourself.
John Meaker, KD4RAS

GET READY FOR FIELD DAY!
By Steve Ford, WB8IMY (June, 1983 QST)

Where will you be at 1800 UTC on June 26, 1993? Staring semi-comatose at your TV set while you watch the 1250th rerun of Planet of the Apes? Wouldn't you rather be sitting in front of a portable transceiver in the sweltering heat, slapping at mosquitoes and wolfing down mustard-drenched hot dogs?

>Given a choice between televised anesthesia and a grueling test of radio skills, the anesthesia . . . I mean, the radio . . . wins hands down. After all, you simply can't miss out on Field Day! It's a rite of passage for every Amateur Radio operator. Not only will you test the limits of your endurance (and the endurance of your equipment), you'll have fun at the same time!

>WHAT IS FIELD DAY? At first glance, it looks and sounds like any other on-the-air contest. It isn't just a contest, though. Field Day is a test of your ability to operate under adverse conditions. It prepares you for the day when disaster strikes and you find yourself providing lifesaving communications without the benefit of commercial electrical power - or even a decent shelter.

>In the true spirit of Field Day, hams throughout the US and Canada set up temporary stations operating under emergency conditions, many using emergency power. The power source can be batteries, generators, solar panels or whatever. Although most hams prefer to operate Field Day in the great out-doors, you can also operate from your home or other building - even mobile!

>The goal of Field Day operating is to contact as many stations as possible. Some hams treat this goal with deadly seriousness. Their final scores mean everything, and they do whatever it takes to push their stations to the top of the heap. Other hams take a more easy-going approach. For them, Field Day is an enjoyable outing with friends. Earning respectable scores is secondary to the enjoyment of the event itself. Either approach is valid and the choice is up to you. If you choose to operate with a group, however, it's a good idea to make sure that everyone shares the same attitudes. Mixing serious and nonserious operators is a formula for friction!

>Your Field Day opeation can take place on any amateur frequency from 160 meters to light, except the 30-meter band. All modes are available and you get bonus points for using satellites or packet radio. You can even operate VHF-FM, but you can't communicate through repeaters . . . . . see page 5

(digipeters and nodes are okay for packet, however).

>There are various operating classes depending on your station configuration:

CLASS A: Clubs or groups of friends (three people or more) operating with emergency power in locations that are not regular Amateur Radio stations.

CLASS A - BATTERY: Same as above but running no more than 5 watts output and using batteries, solar panels, wind generators, water generators and other power sources excluding motor-driven generators or commercial mains.

CLASS A - COMMERCIAL: Same as Class A, but using commercial power.

CLASS B: Similar to class A, but only one or two operators.

CLASS B - BATTERY: Same as Class A Battery, but only one or two operators.

CLASS B - COMMERCIAL: Same as Class B, but using commercial power.

CLASS C: Mobile stations using emergency power (includes boats and airplanes).

CLASS D: Home stations using commercial power.

CLASS E: Home stations using emergency power.

>When you make a Field Day contact, you exchange your operating class (and the number of transmitters you are using simultaneously) and your ARRL/Canadian Section. A typical Field Day voice exchange might sound like this:

CQ Field Day, CQ Field Day from KR1S

KR1S from WB8SVN

WB8SVN from KR1S, please copy 4A Connecticut, QSL?

(KR1S is operating four transmitters in Class A from the Connecticut Section. Even if he was using battery power, he'd still use "4A").

QSL? We're 1C Illinois. Good luck!

(WB8SVN is operating 1 transmitter in Class C).

ON THE AIR: SSB and CW are the modes of choice on the HF bands, although you can use RTTY, AMTOR, PacTor and so on. If you're operating by yourself, you're the control operator and you're limited to the frequencies and modes permitted by your license. In a group operation, however, you are allowed to use the full privileges of the designated control operator. (This is a great way for codeless Technicians to get a taste of HF operating).

>Your first few minutes of Field Day operating may be awkward, but you'll become accustomed to it quickly. You'll also develop valuable operating skills as you prowl the bands for contacts. Some hams prefer to stake out a clear frequency and call "CQ Field Day". Others like the search-and-pounce technique.

>If you're new to contest-style operating, it may be a good idea to have someone keep the log while you make contacts. It can be distracting to juggle both tasks at once.

HOW TO GET BONUS POINTS

100% EMERGENCY POWER: 100 points per transmitter. All equipment at the Field Day site - including lights - must be operating from a source independent of commercial mains.

PUBLIC RELATIONS: 100 points for media publicity. Invite TV, Radio and newspapers to visit your site on Field Day. (include copies of your letters and/or newspaper clippings with your FD report). You can also earn the PR bonus by locating your station in a public place, such as a mall or park. If you offer site tours and information handouts to visitors, you'll earn an additional 100 points.

MESSAGE ORIGINATION: 100 points for sending a message from your group leader to your Section Manager or Section Emergency Coordinator. Your message must include the name of your club or group, location and the number of ARES members participating (if any). The message must be transmitted during Field Day in official ARRL message format.

MESSAGE RELAY: You'll get 10 points for each message your station relays during the Field Day period (up to a maximum of 100 points).

SATELLITE QSO: Make at least one contact through a satellite and you'll bag another 100 points. Your satellite station does not count as an additional transmitter.

NATURAL POWER: If you make a minimum of 5 contacts without using power from commercial mains or petroleum derivatives (cars, generators) you'll earn 100 points. Examples of natural power include solar, wind, methane or grain alcohol. You can also operate using batteries charged by natural means.

W1AW MESSAGE: During Field Day, W1AW will transmit a special Field Day bulletin. You can get 100 extra points by simply copying the message and including it with your Field Day report.

PACKET RADIO: Make at least one packet contact and you'll be eligible for a 100 point bonus. Your packet station does not count as an additional transmitter.

VHF/UHF STATION: Set up a dedicated VHF/UHF station and you'll earn 100 points after you've made at least 10 contacts. The VHF/UHF station does not count as an additional transmitter.

TREASURER'S REPORT - YEAR TO DATE
By K4EOS, Clyde Lee

Transferred from old acct.	977.82
DEPOSITS: 50/50,ARRL,dues,donations, loan,stu.fees,Xmas pty.	3676.79
TOTAL INCOME	4654.61
EXPENSES: ARRL.bnk.chgs,Bud loan, gifts,Ins. Off.supp,POBox, postage,printing,stu.bks, tel, Xmas pty.,Exam.fees	3447.40
BALANCE AS AT 05/31/93	1207.40
Bud's loan bal.as at 12/31/92	2333.00
Paid through 5/31/93	721.50
BALANCE DUE BUD	1611.50

TARC FRIENDSHIP NET
Thursdays - 146.910-600
VIP net @ 10:00 AM - Original net @ 6:30PM
By Cliff KC4SYD

Net Control was greeted by 31 class members at Apollo Elementary with "good morning, Cliff" when Nick, DE4BBM checked in on the VIP net on 3 June. Believe it or not, the net controller was speechless - a rare occurrence! There are many pluses in working a net, but this one will stand out as a highlight of my net control career. Headphones off to Ms. Holcomb, Nick, and the students at Apollo Elementary. You have warmed my heart!

In the 12 week period between 3/11/93 and 5/27/93, we've had an average of 60 check-ins per week. The ratio is about 30%/60% morning/evening.

Just think of all those fellow hams out there that are profiting from the Monophonic Audio Bulletin Board. It's mind boggling! But we need more: 1) looking fors; 2) swaps or 3) sale items. When you PTT, rest assured there are 60+ ham friends awaiting your utterance!

As we go into our tropical mode, we will lose some of our "snow birds", plus vacationers. But I predict we will top 100 check-ins come next fall. I figure that's the time to ask for a raise (K4EOS please copy).

73's, ya'll - keep the check-ins coming in. and meet me at Field Day. Let's put a face and voice to that call sign!

If Moses had been a committee, the Israelites would still be in Egypt!

MINUTES OF MAY MEETING
By KC4UFI Jerry Russell, Secretary

Pledge to flag at 1900. Introduction of all members by call sign, with special introduction of all new "KE" call signs. Ozzie N4SCY announced that award certificates had been presented himself and Neal W4GMW from the American Diabeties Society for their support in a bike ride the previous week.

A fox hunt was announced to be presented by John KB3GK for June 6th.

Second reading of the proposed By-Laws changes was read and N4MCZ made a motion that changes be approved. Seconded by K4SJC. Motion passed.

Les K4SJC presented a motion to purchase a new antenna for the 146.91 Repeater, which was approved.

Florida Marine Patrol asked the club to submit a letter requesting tower space. I,KC4UFI, volunteered to write letter.

After intermission, Field Day preparations were discussed. It is to be held at Sand Point Park. Neil W4GMW took notes on the Field Day Discussion. $300.00 expense budget for Field Day was voted on and approved.

Meeting adjourned.

FIELD DAY AND NONHAMS

Field Day is the perfect time to recruit new hams. Do you know a friend or family member who is interested in Amateur Radio? Invite them to participate in Field Day!

>You don't need a ham license to be a contact logger. Ask them to help keep the computer or paper log while you operate the radio. Anyone of any age can learn to do this.

>Your friends and family can even make contacts on the air. FCC rules simply require that the control operator be present and in control of the radio. After the control operator selects the frequency and adjusts the rig, anyone can speak into the microphone. This gives prospective hams a quick taste of what it's like to be on the air. Most people find it pretty exciting and want to become hams themselves! WB8IMY

ABELL'S ANECDOTES

By Pike Abell, W4EPU

I am going to tell you about a dream I had. I was sitting in a chair hollering "Action", "Cut" and all that jargon. I was directing a movie. The movie was all about Hollywood doctors. Actually, it was more like, about the medical profession. It was starring some of the best known names in the world of medicine and sports. I remember their names vividly:

Al K. Seltzer, famous German Gastroenterologist.
Al K. Hall, founder of the Al K. Hall Anonymous.
Penny Cillen, famous bread maker.
Pepito Bismol, well known Spanish actor.
May Lox, sister-in-law of Pepito Bismol.
Ty Lee Nol, Vietnamese Neurologist.
X Lacks, Chinese Proctologist.
Dee P. Heet, Ex-linebacker for the Green Bay Packers.
Mike A. Tin, Famous sneaker manufacturer.
Ben Gay, ex-tight end for the San Francisco 49'ers.
Doctor Shoals, famous podiotrist.
Jerry Tall, NBA superstar and body builder.
Cotton Schwab, brother of investment counselor Charles Schwab.
Q. Tipp, first cousin of Cotton Schwab.
Robie Tussin, son of the one-time Surgeon General.
Ny Quil, well known Tibetan sleep therapist.
Cori Seeden, ex Miss California, 1975.
N. Sulin, starred in the Star Trek series.
Coe Dean, ex-hippie of the 60's.
Sudie Fed, well known sinus specialist.
Herb A. Side, famous outdoorsman.
Sugar Pill, sweetest lady you'll ever meet.
Lana Cane, every male's dream girl starting from scratch.
Theme song and musical score by Band Aid.
Advertising by Ad Vil.

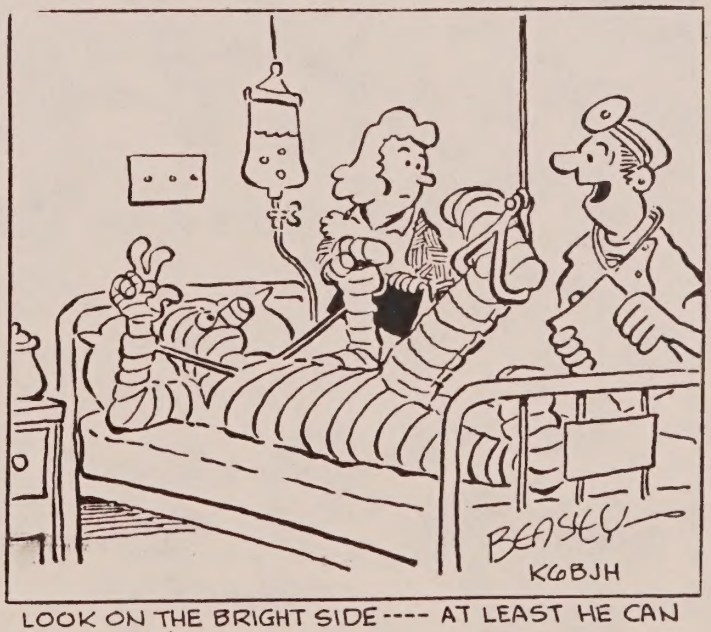
With a cast like the above, no doubt the movie would have been a success.

She lay quivering, her head resting against the cool white pillows, relaxed. He leaned above her, smiling, and his voice seemed far away. "You're not sorry?" he asked softly. She shook her head. Sorry - she was glad, so very glad!

She had been aghast when he first made the suggestion, yet after she had seen him again and again, she knew he would have his way - it was inevitable. Finally, she consented.

How well she remembered what followed; knocking timidly on his door and being led in. How they had spoken casually of mundane things, rejecting the thought uppermost in both their minds. How he had been so gentle and solicitous of her comfort. Then, how he had bent over her, his knee touching hers. Close, then closer. She could feel again his breath on her throat, the warmth of his hands on her checks, his whole body striving for accomplishment. And the final ecstatic pang, her reeling senses, the world slipping away - and now it was over.

Her tooth was out!



LOOK ON THE BRIGHT SIDE---- AT LEAST HE CAN WORK C.W.

MEMBERSHIP UPDATE

Total Membership: 234 (includes 39 family members & 7 honorary)

New Members: KD4ZAI Walt Hollowell
K4GXR Ron Richardson
Stephen Saunders
KE4AGH Vern Andrews
KE4BJF Gerry Moscovitz

Renewals: KV4BY Clarence Bauer
KK4EY &KD4EYR Lee & June Roll
K4EOS Clyde Lee
KD4MIV R. Metzgar
K3VMS Fred Shetler
KO4NQ R. Poulin
KE4BBI Penny Poulin
W4VPV Walt Houch
W4OPZ Joe Singleton
KD4RQS John Wolley
KF4UN Dave Post
KO4NXF Roy Smythe
KH6GH Art Zippler

UPCOMING HAMFESTS

7/31-1	Jacksonville	Prime Osborne Conv.Cntr. So.Lee & W.Bay Talk-in on 146.76
9/11-12	Melbourne	Melbourne Auditorium 625 Hibiscus Blvd. Talk-in on 146.76
9/26	N.Pt.Richey	New Pt.Richey Rec.Centr. 6630 Van Buren. Talk-in on 145.350 or 147.150
10/9	Titusville	Sand Point Pavilion
9/25	Starke	Bradford Co.Fairgrnds. US301&SR100 Talk-in on 145.150
10/23-24	W.Palm Bh.	Expo Ctr., S.Fla Fairgrnds. SR80 east of US441 Talk-in on 147.165
10/29-30	St.Pete	QCWA Nat'l Conv.atS.Pete Clrwtr.AP Hol.Inn. Talk-in on 145.290

TITUSVILLE AMATEUR RADIO CLUB
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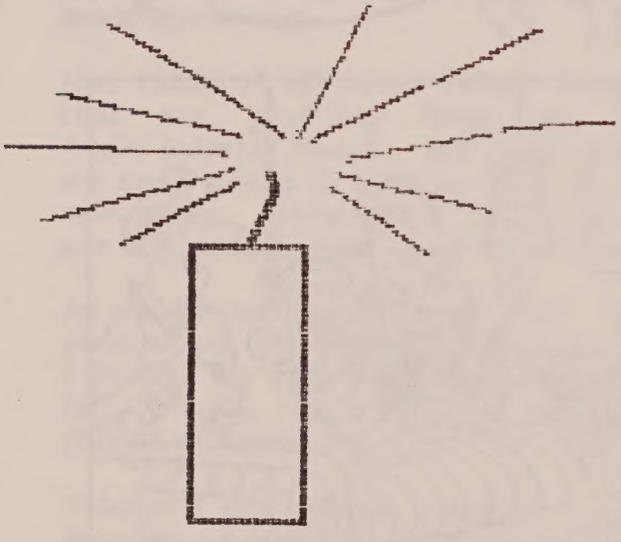

HAPPY 4TH